Task 49/IV

Solar Process Heat for Production and Advanced Applications

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Content:

- **Motivation**
- **What are we doing**
- **Some examples**
- **Concluding remarks**

Source: GEA Brewery Systems

Source: Smirro GmbH

Renewable Energy Technologies for Power Generation

Hydro

Solarthermal

Biomass

Geothermal

Tidal

Wave

Photovoltaic

Wind

Renewable Energy Technologies for Process Heat

Geothermal

Concentrating Solar

Biomass

Non-concentrating Solar

Structure


GEA brewery systems


GEA brewery systems


Sunmark A/S

OPTIMIZATION

PROCESS

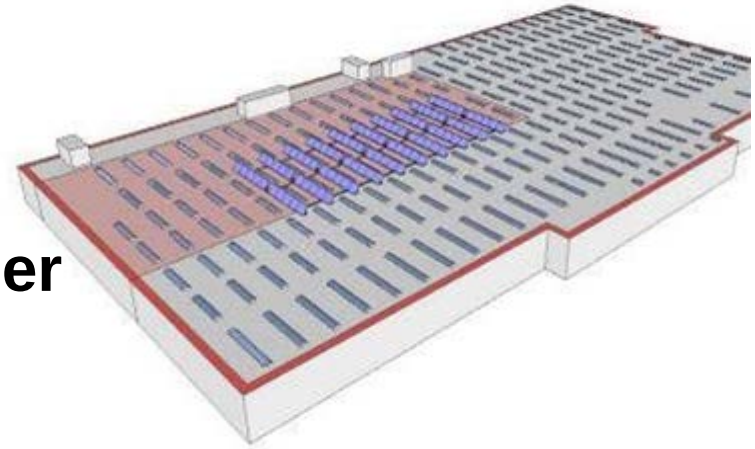
INTEGRATION

Subtask B
Process optimization
Process integration
Process intensification

Subtask C
Case studies
Integration tools
Dissemination

Subtask A
Process heat collector
Development
Testing

Highlights:

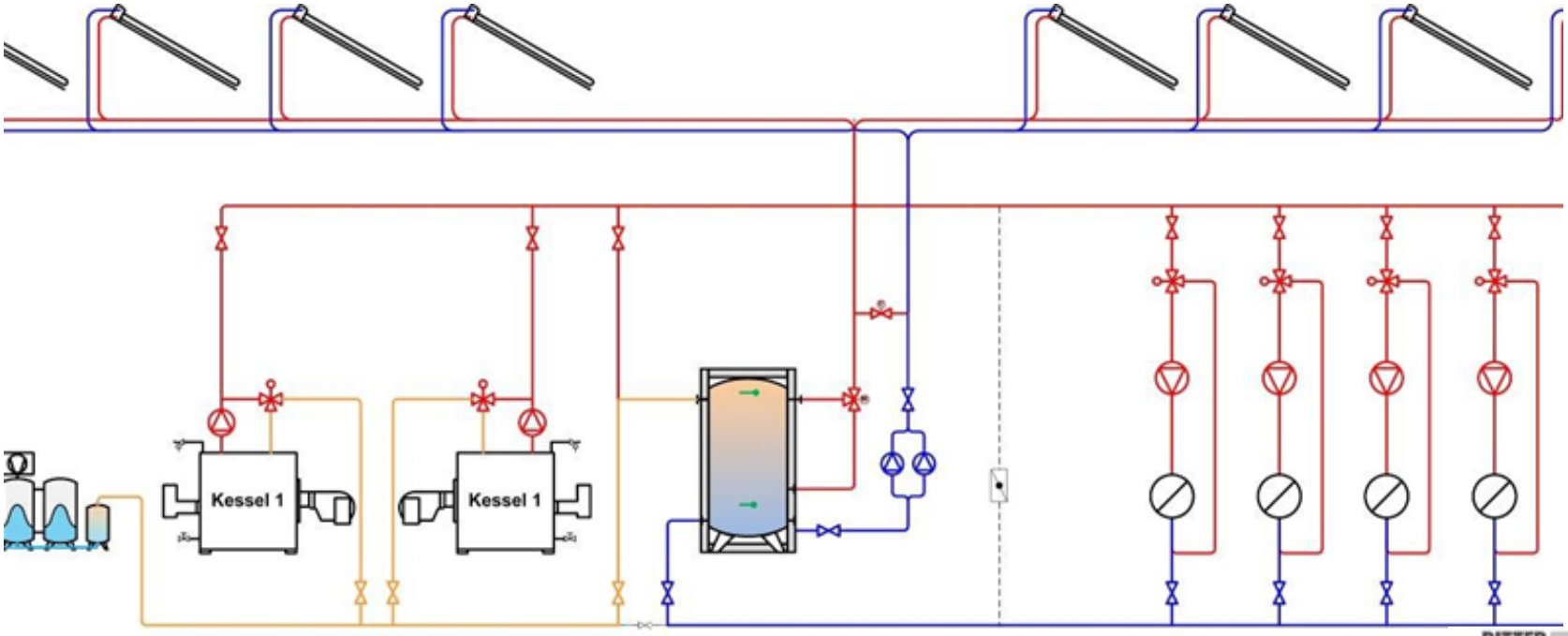


Ritter XL Installation at Zehnder

400 m² gross area
Hot water for paint shop

Highlights: Ritter XL Installation at Zehnder

- Direct integration of solar system without heat exchanger
- Operation Temperature 80 – 85°C
- Alternatively: Feedwater preheating



Highlights: EU InSun Project

Started early 2012
Solar Process Heat demonstration plants in 3 different industries

Co-ordinated by zafh.net
Centre of Applied Research Sustainable Energy Technology at University of Applied Sciences Stuttgart

Dr. Dirk Pietruschka

InSun
Meat Factory Berger, Austria/Sieghartskirchen

Key data

- 1077 m² Flat Plate Collectors (glutamugl HT)
- 60 m³ hot water storage tank

Hot water preheating for dehumidification of maturation chambers

- 5 – 10 m³/h hot water demand
- Usage of waste heat until 40°C
- Solar heating up to 70°

Preheating feed water for steam production (ham cooking)

- 3 m³/h hot water demand
- Usage of waste heat until 30°C
- Solar heating up to 95°

InSun

Brick drying at Laterizzi Gambettola, Italy

Key data

- 2.640 m² Linear Fresnel Collector (Soltigua FTM36)
  - 1.056 m² Thermo oil / HX steam generator
  - 1.584 m² Direct steam generation
- Peak solar field capacity: 1,2 MW

Application:

- Brick drying at 200 to 260°C
- Steam production at 180°C (12 bar)
- Required total heating power: 2.2 MW
- Heating energy demand: 12 GWh/a

InSun
Milk powder production at Lácteas Cobreros (LACO) Castrogonzalo-Zamora, Spain

Key data

- 2.040 m² Parabolic Trough Collector (Smirro)
- Solar field design capacity at 200°C: 1 MW
- HTF: Thermal oil

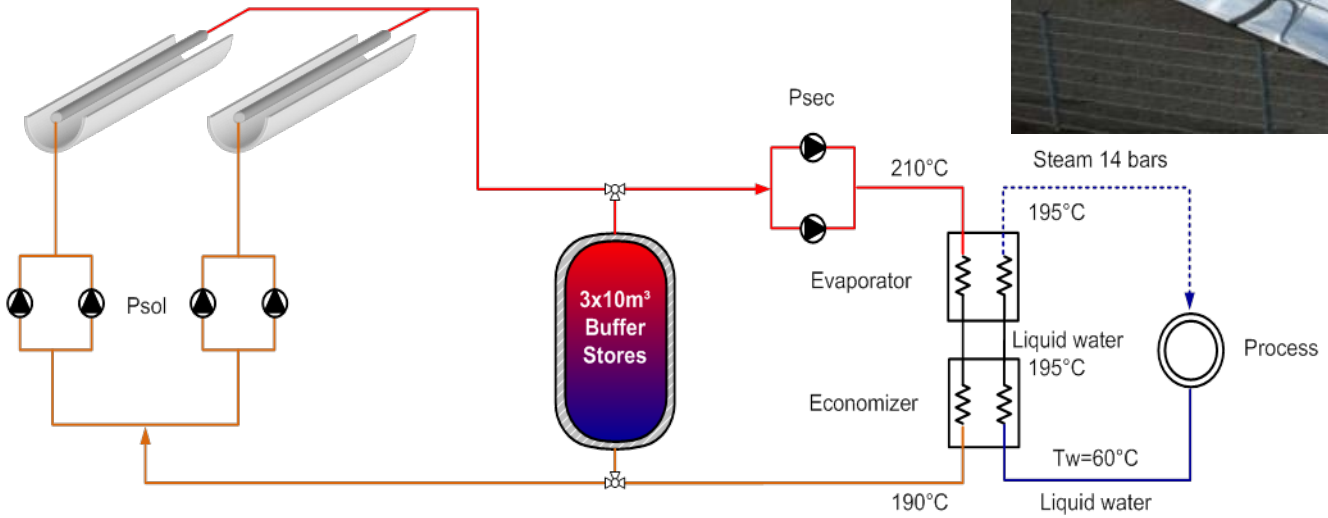
Application:

- Milk Powder drying at 185°C (120-150 d/yr)
- Production capacity: 2000l milk per day
- Pasteurizing processes and water heating
- Steam production at 195°C
- Required total heating power: 1,5 MW (24 h/d)
- Heating energy demand: 35 MWh/d

InSun
Milk powder production at Lácteas Cobreros (LACO) Castrogonzalo-Zamora, Spain

Smirro 40 kW reference plant in Germany

LACO plant schematic



Concluding Remarks

- **Industrial process heat applications are a significant potential market for solar thermal technologies**
- **Suitable collector technologies are offered by a number of suppliers**
- **First demonstration projects have been realized, or are under development**
- **Challenges remain:**
  - Plant engineering / System Integration / Optimization
  - Collector improvements
  - Competitiveness with other heat sources / Incentive schemes

- **Task 49/IV Website: www.iea-shc.org/task49/**
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